

Amendments to the Claims:

1. (Cancelled)

2. (Currently Amended) A magnetic sensor device comprising:
a substrate;

a probe element supported by the substrate, the probe element
including an array of binding sites configured to receive molecules labeled with
5 magnetic particles;

a first magnetic field generator supported by the substrate to generate a
magnetic field having a first frequency, phase, and amplitude through the probe
element;

a magnetic sensor element which senses a magnetic property [[[]]]of at
10 least one magnetic particle received by the probe element which magnetic property is
related to the first generated magnetic field and generates a sensor signal having a
second frequency, phase, and amplitude;

a second magnetic field generator which generates a second magnetic
field having a third frequency, phase and amplitude; and

15 a cross-talk suppression circuit which suppresses at least one of
capacitive and magnetic cross-talk between the first magnetic field generator and the
magnetic sensor element.

3. (Currently Amended) The magnetic sensor device according
to claim 2, wherein the cross-talk suppression circuit further includes electrostatic
shielding device between the magnetic sensor element and the magnetic field
generator.

4. (Currently Amended) The magnetic sensor device according
to claim 2, ~~wherein the magnetic field generator has a first frequency and a first phase
and the magnetic sensor element has a second frequency and a second phase, wherein~~
the cross-talk suppression circuit includes at least one of:

- 5 an electrical frequency distinguishing circuit which distinguishes between the first frequency and the second frequency; and
- an electrical phase distinguishing circuit that distinguishes between the first phase and the second phase.

5 5. (Currently Amended) The magnetic sensor device according to claim 2, wherein ~~the magnetic field generator has a first frequency and a first phase and~~ an output signal of the magnetic sensor element has ~~the first frequency and a second phase equal to the first phase and~~ a phase shift caused by the cross-talk, wherein the cross-talk suppression circuit compensates for the cross-talk caused phase shift.

 6. (Currently Amended) A magnetic sensor device comprising:

 a substrate;

 a first magnetic field generator including a first conductor supported by the substrate and a first ac current source which generates ~~[[an]]~~ a first ac current with a first frequency, a first phase, and a first amplitude flowing through the conductor;

 a magnetic sensor including a sensor element supported by the substrate and a sensor circuit which processes a sensor signal with a second frequency, a second phase and a second amplitude from the sensor element;

a second magnetic field generator including a second conductor supported by the substrate and a second ac current source that generates a second ac current with a third frequency, a third phase, and a third amplitude; and,

 a cross-talk suppression circuit which suppresses cross-talk between the magnetic sensor element and the first magnetic field generator, the cross-talk suppression circuit combining a signal from the first ac current source with at least a component of the sensor signal.

7. (Cancelled)

8. (Currently Amended) A magnetic sensor device comprising:

 a substrate;

a magnetic sensor element having a second frequency on the substrate;
a first magnetic field generator which generates a first magnetic field
of a first frequency on the substrate;
a second magnetic field generator generates a second signal having a
third frequency;
a cross-talk suppression circuit which compensates for a cross-talk
signal originating from the first magnetic field generator having the first frequency.

9. (Withdrawn) The magnetic sensor device according to
claim 8, wherein the second magnetic field generator generates an anti-phase current
or an inverse voltage for compensating the cross-talk signal originating from the first
magnetic field generator having the first frequency.

10. (Cancelled)

11. (Currently Amended) The magnetic sensor device according
to claim 2, wherein said first magnetic field generator is positioned between said
substrate and said magnetic sensor element.

12. (Withdrawn) The magnetic sensor device according to
claim 8, wherein said first magnetic field generator is positioned adjacent one side of
the magnetic sensor element and the second magnetic field generator is positioned on
an opposite side of the magnetic sensor element.

13. (Withdrawn) The magnetic sensor device according to
claim 8, wherein the magnetic sensor element lies in a plane, and said first magnetic
field generator is positioned adjacent one side of the magnetic sensor element and the
second magnetic field generator is positioned on the opposite side of the magnetic
5 sensor element at a same position with respect to a direction one of parallel and
perpendicular to the plane of the magnetic sensor element.

14. (Withdrawn) The magnetic sensor device according to claim 13, further including:

a circuit which determines a concentration of magnetic particles adjacent the magnetic sensor element and the magnetic field generators.

15. (Withdrawn) The magnetic sensor device according to claim 13, wherein the cross-talk suppression circuit includes electrical frequency distinguishing circuitry which distinguishes at least between the first frequency and the second frequency.

16. (Withdrawn) The magnetic sensor device according to claim 8, wherein the magnetic sensor element lies in a plane, and the first and second magnetic field generators are located at different levels with respect to the plane of the magnetic sensor element.

17. (Currently Amended) The magnetic sensor device according to claim 2, further including:

a flux guiding layer positioned between (1) the magnetic sensor element and the ~~at least one~~ first magnetic field generator, and (2) the substrate.

18-19. (Cancelled)

20. (Previously Presented) The magnetic sensor device according to claim 2, wherein said magnetic sensor element is a magneto-resistive sensor element.

21. (Withdrawn) The magnetic sensor device according to claim 6, wherein the at least one magnetic particle is a magnetic label coupled to a biological molecule.

22. (Previously Presented) A method of molecular diagnostics, biological sample analysis, or chemical sample analysis comprising:

passing a sample which includes biological molecules labeled with the magnetic particles over the magnetic sensor device as claimed in claim 2;

receiving some of the biological molecules in some of the binding sites;

measuring the magnetic property of the magnetic particles.

23. (Currently Amended) The magnetic sensor device as claimed in claim 6, wherein the cross-talk suppression circuit applies a component of the first ac current source signal to the sensor element.

24. (Currently Amended) The magnetic sensor device as claimed in claim 6, ~~further including: a second magnetic field generator including a second conductor supported by the substrate and a second ac current source; and~~ wherein the cross-talk suppression circuit combines a signal component of the third ac current from the second ac current source with a component of the sensor signal.

25. (Currently Amended) The magnetic sensor device as claimed in claim 6, ~~further including: a second magnetic field generator including a second conductor supported by the substrate, the second conductor being connected with the first ac current source~~ wherein at least one of:

the third frequency is different from the first frequency;

the third phase is different from the first phase;

the third amplitude is different from the first amplitude.